Matrox Convert DVI

Installation and User Guide

February 26, 2010

Y11140-201-0100

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1

Introducing Matrox Convert DVI

This chapter outlines the features of Matrox Convert DVI, provides the Convert DVI system requirements, and describes the available documentation.

Welcome to Matrox Convert DVI

Matrox Convert DVI lets you convert high-resolution DVI sources to HD and SD video for broadcast, display, and recording. It takes your DVI output and converts it to high-quality SDI and analog video simultaneously. Stereo audio input can be embedded into the SDI output from Matrox Convert DVI. You can choose to output your entire computer screen, or focus on details in a specific region of interest on the screen. To ensure optimal quality and flexibility, Matrox Convert DVI provides genlock with timing offset controls, an advanced downscaling algorithm, a flicker reduction filter, and one-to-one pixel mapping.

Matrox Convert DVI is ideal for creating broadcast video from computer applications such as video games, PowerPoint presentations, and web browser sessions. It also provides a user-friendly way to create software application training videos. You can use Matrox Convert DVI independently of a PC in stand-alone mode to deliver SDI and analog video in applications where the DVI signal is not coming from a computer, but from a DVI camera or other device.

Supported video output formats

Matrox Convert DVI supports the following video output formats:

- NTSC.
- PAL.
- 1280×720p @ 50 and 59.94 fps.
- 1920×1080i @ 25 and 29.97 fps.

Hardware supplied for Matrox Convert DVI

- Matrox Convert DVI box.
- Matrox Convert DVI cable (includes USB, DVI, and audio connectors).
- Y/C (S-Video) adapter cable.
- External AC/DC adapter and power cord.

Matrox Convert DVI system requirements

For initial configuration, Matrox Convert DVI requires a computer with the following system configuration:

- Microsoft Windows 7 Professional or Ultimate (32-bit), or Windows XP Professional (32-bit) with Service Pack 3.
- One free USB 2.0 port.
- A PCIe display card that supports two DVI-D outputs. It is recommended that you connect Convert DVI to the secondary DVI connector, and connect your primary DVI monitor to the other connector.

- An optional DVI monitor that supports digital input can be used to preview the Convert DVI desktop. A native display resolution of 1920×1200 is recommended for previewing all HD formats.

To use Convert DVI in stand-alone mode, the only requirement is a DVI device, such as a camera or medical device, which provides a DVI-D output signal in a supported resolution. For a list of the supported DVI desktop resolutions, see "Supported Convert DVI desktop resolutions" on page 20.

For up-to-date information about system requirements, check the Support section of our website for your Matrox product at www.matrox.com/video/support.

About this manual

This manual provides you with information about how to install, use, and configure your Matrox Convert DVI.

Style conventions

The following style conventions are used in this manual:

- The names of files, folders, and manuals appear in *italics*. For example:
  - The data is stored in the *Sample.avi* file.
  - The file is located in your *C:\Windows\System* directory.
  - Please refer to your *Matrox Convert DVI Release Notes*.
- Menus and commands that you need to choose are displayed in the form **Menu > Command**. For example, **File > Save** means click **File** in the menu bar, then click **Save** in the menu that appears.
- The names of keys are displayed in small capital bold letters, such as the **CTRL** key.
- A plus (+) sign is used to indicate combinations of keys and/or mouse operations. For example:
  - **CTRL+C** means to hold down the **CTRL** key while pressing the **C** key.
  - **SHIFT+click** means to hold down the **SHIFT** key while you click an item with the mouse.

Last-minute information

Any important information that wasn't available for inclusion in this manual by publication time is provided to you in the *Matrox Convert DVI Release Notes*.

Your notes

2

Connecting External Devices to Matrox Convert DVI

This chapter shows you how to connect external devices to Matrox Convert DVI.

Available Convert DVI connections

Matrox Convert DVI allows you to connect multiple devices for simultaneous output, and supports the following connections:

- One DVI input and one DVI output.
- One USB 2.0 port (required for configuring Convert DVI only).
- Your choice of one of the following video output combinations:
  - HD SDI output with embedded audio and simultaneous HD analog component output.
  - SD SDI output with embedded audio and simultaneous SD analog component output.
  - SD SDI output with embedded audio and simultaneous S-Video and composite output.
- Genlock reference input.
- One RCA stereo output.
- DC power jack.
- One male stereo audio input and one female stereo audio output.

The connections you make depend on the type of video you want to output, such as SDI and analog component, and how you want to use your Matrox Convert DVI. You can use Convert DVI with a computer and a secondary display as explained in the next section, or in stand-alone mode as explained in "Using Matrox Convert DVI in stand-alone mode" on page 7.

Using Matrox Convert DVI with a computer and a secondary display

You can connect Matrox Convert DVI to a computer in order to broadcast video from computer applications, such as PowerPoint presentations, web-based content, and video games. You use your computer's secondary DVI output as the input to Convert DVI, which is converted to high-quality video and output through Convert DVI's SDI and analog outputs. To configure Convert DVI's video outputs, you must connect Convert DVI to your computer using a USB connection.

When Matrox Convert DVI is connected to the secondary DVI output from a computer's display card (see "Connecting Convert DVI" on page 8), the Windows operating system detects the Convert DVI as a secondary monitor. Because Convert DVI doesn't have a screen, you can connect a DVI monitor (secondary display) to the DVI OUT on your Convert DVI in order to preview what will be output through Convert DVI's video outputs. Whatever is displayed on the secondary display's desktop (Convert DVI desktop) is output as high-quality video through the Convert DVI video outputs. If you've defined a

region of interest, however, only your selected area of the Convert DVI desktop will be output.

Although it is recommended that you have a secondary display to use Convert DVI, you can also use Convert DVI with only your primary display by duplicating (cloning) your primary desktop onto your Convert DVI desktop.

You can configure the Convert DVI's desktop settings using the Windows display settings for your secondary display as explained in "Configuring your display settings for use with Convert DVI" on page 17.

Using Matrox Convert DVI in stand-alone mode

Once you've configured Matrox Convert DVI, you can program Convert DVI to stand-alone mode using your last-applied configuration settings. When using Convert DVI in stand-alone mode, you can disconnect the USB cable from the host computer and use Convert DVI with any device that has a DVI-D output in a supported desktop resolution. For example, you can connect Convert DVI to the DVI output from a camera or medical device, or the DVI output from a different computer from the host computer that you used to configure Convert DVI.

When using Convert DVI in stand-alone mode, the DVI input to Convert DVI is converted to high-quality video and output through Convert DVI's SDI and analog outputs according to the programmed configuration settings. In order to preview the Convert DVI desktop, you can connect a DVI monitor to the DVI OUT on Convert DVI.

For more information on stand-alone mode, see "Programming Convert DVI to stand-alone mode" on page 33.

Using DVI to HDMI and DVI to DisplayPort adapters

If the device that you want to connect to Convert DVI's DVI input or output does not have a DVI connector, you can use an HDMI to DVI adapter, or a DisplayPort to DVI adapter to connect your device to Convert DVI (VGA to DVI adapters are not supported).

Connecting Convert DVI

Matrox Convert DVI includes a cable to connect the Convert DVI box to a computer or any DVI device that you want to use as the input to Convert DVI. The cable has four connectors on the computer end, and two connectors to attach to the Convert DVI box.

Important You need to connect Matrox Convert DVI to a computer via the provided USB connectors (see steps 1 and 4 below) only when you want to configure your Convert DVI as explained in "Configuring Matrox Convert DVI" on page 16. Once you've configured Convert DVI, you can program Convert DVI to stand-alone mode as explained in "Programming Convert DVI to stand-alone mode" on page 33.

To connect Convert DVI to a computer:

① Connect the USB B connector on the Convert DVI end (two connectors) of the cable to the USB B port on your Convert DVI.

② Connect the DVI connector on the Convert DVI end of the cable to the DVI IN connector on the Convert DVI. Tighten the thumb screws to ensure a stable connection.

③ Connect the DVI connector on the computer end of the cable (four connectors) to the secondary DVI connector on your computer, or the DVI connector of the device you want to use as input to Convert DVI. Tighten the thumb screws to ensure a stable connection.

Note If your computer or device has an HDMI or DisplayPort output, you can use a third-party HDMI to DVI or DisplayPort to DVI adapter.

④ Connect the USB A connector on the system end of the cable to the USB A port on your computer (a High-Speed USB 2.0 connection is required).

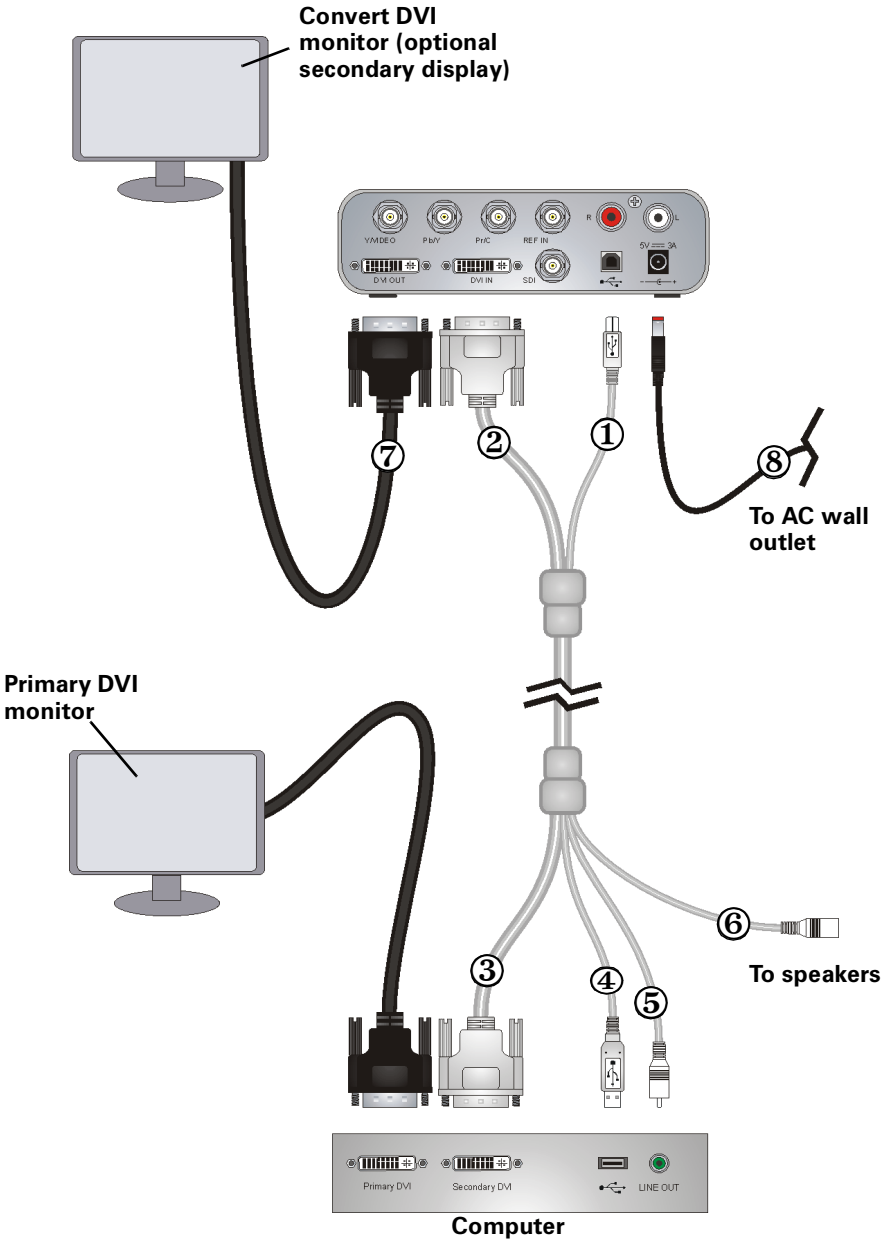
⑤ Insert the male stereo audio plug on the system end of the Convert DVI cable into the LINE OUT jack on your sound card or laptop.

⑥ Connect the female stereo audio jack on the system end of the Convert DVI cable to your speakers.

⑦ Connect the DVI connector on your DVI monitor (secondary display) to the DVI OUT on Convert DVI. For more information, see "Using Matrox Convert DVI with a computer and a secondary display" on page 6.

⑧ Connect the external power supply to the DC power jack on the Convert DVI, and to an AC outlet. If your Convert DVI comes with an external power supply cable with international adapter plugs for use in different regions, see "Convert DVI power supply and adapter plugs" on page 10.

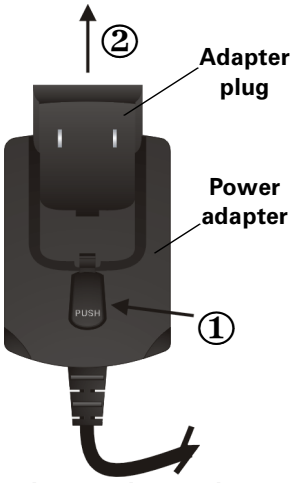
Note When your Convert DVI is properly connected, and Windows has started, the blue LED located at the front of the Convert DVI will light up and be constant.


Convert DVI monitor (optional secondary display)
Y/MDEO
Pb/Y
Pr/C
REF IN
R
L
5V 3A
DVI OUT
DVI IN
SDI
1
2
3
4
5
6
7
8
To AC wall outlet
Primary DVI monitor
To speakers
Primary DVI
Secondary DVI
LINE OUT
Computer

Convert DVI power supply and adapter plugs

If your Convert DVI kit includes an external power supply cable with international adapter plugs for use in different regions, the following instructions detail how to remove and insert the adapter plugs:

- To remove an adapter plug from the power adapter, hold down the button labeled **PUSH** on the power adapter, and then slide the adapter plug up until it releases from the power adapter.
- To insert an adapter plug into the power adapter, ensure that the adapter plug is properly aligned with the corresponding slot on the power adapter, and then slide the adapter plug down into the power adapter until it locks into place.



Removing an adapter plug

Inserting an adapter plug

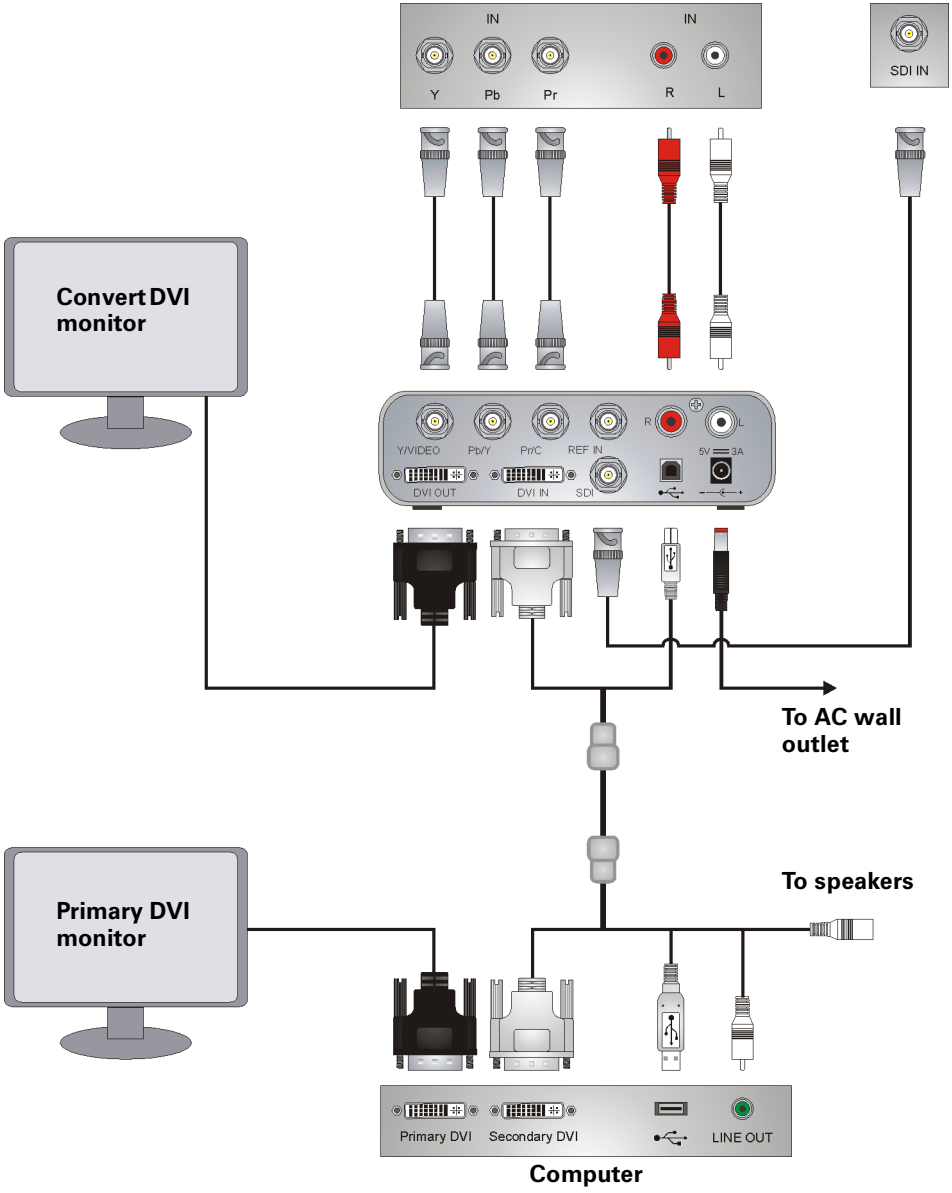
Typical Matrox Convert DVI connections

The following illustrations show some typical Convert DVI connections. In these illustrations, we've connected a DVI monitor to preview the Convert DVI desktop, and also two different types of video devices to the Convert DVI outputs (such as analog component and SDI). We've connected the audio output from the Convert DVI box to one of the video devices, but you can connect it to a sound mixer if you are using one.

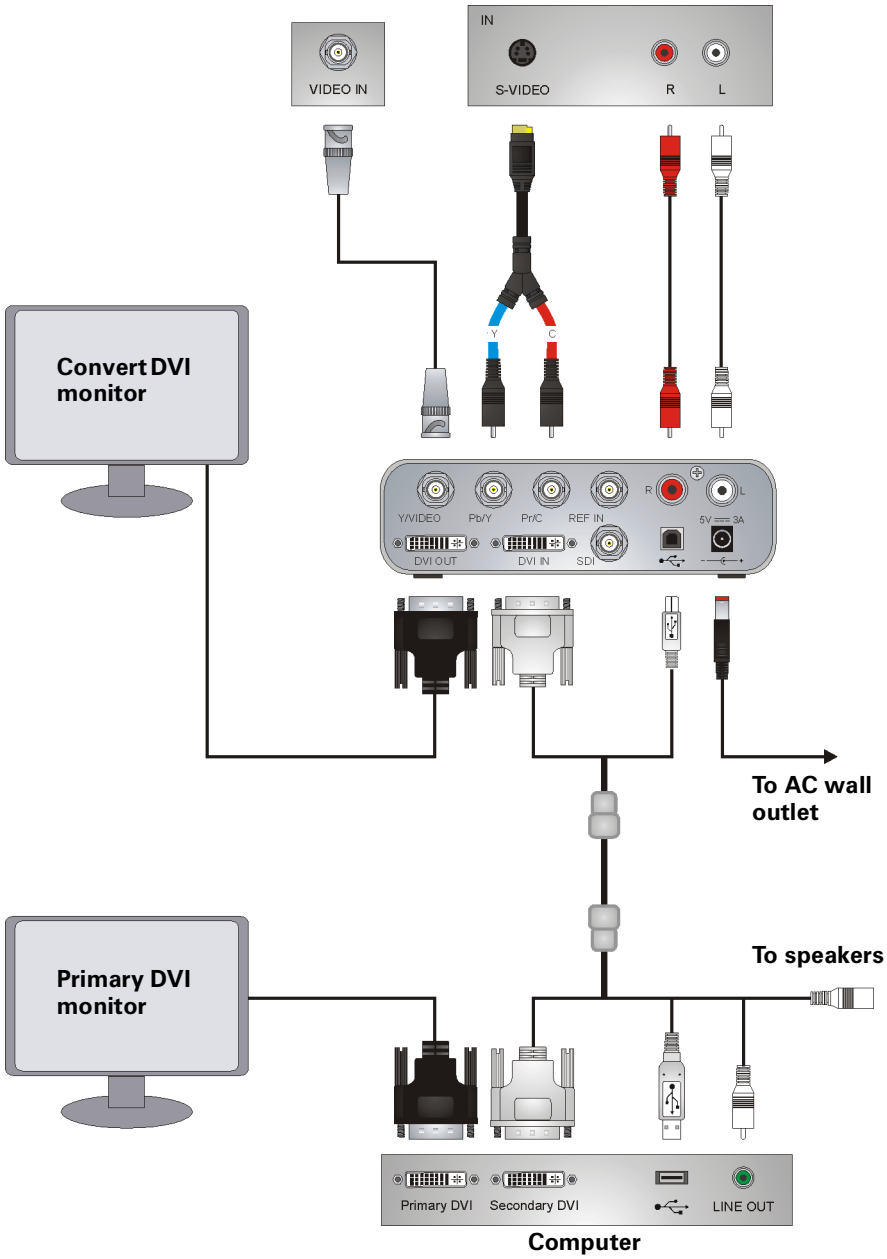
Remarks

- The USB connections in these illustrations are required only when you want to configure Convert DVI, and are not needed if you want to use Convert DVI in stand-alone mode.
- As shown in "Analog component and SDI connections (stand-alone mode)" on page 14, you can have the DVI-based input device that you'll be using in stand-alone mode connected while you're configuring Convert DVI. For example, you could connect your DVI camera while using your laptop to configure Convert DVI.
- You can also connect an external sync generator to ensure proper equipment timing. However, this is optional as the Convert DVI generates its own internal reference signal if an external genlock is not available.

Analog component and SDI connections

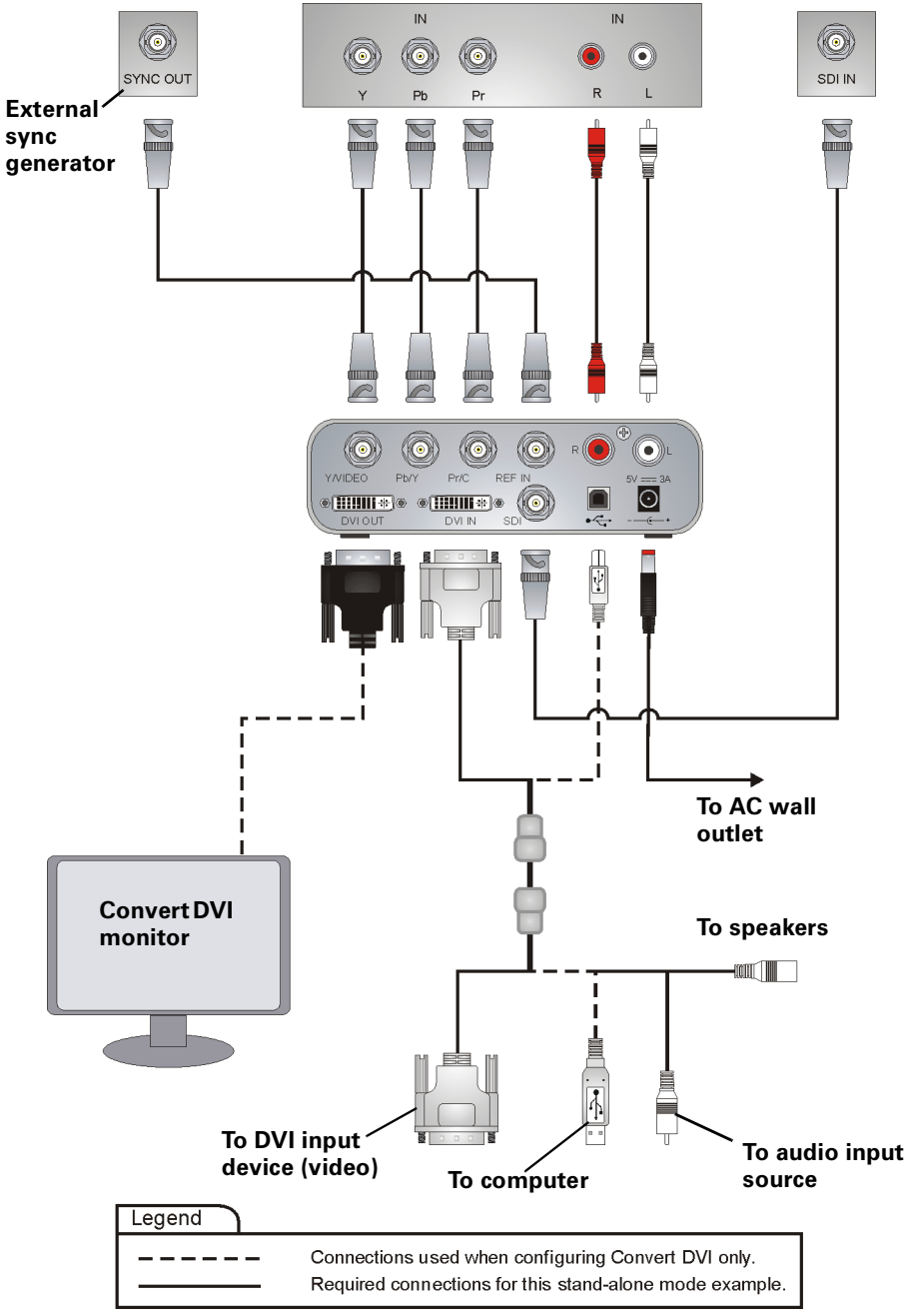


Composite and S-Video connections



Typical Matrox Convert DVI connections

Analog component and SDI connections (stand-alone mode)



3

Installing Your Matrox Software and Configuring Your Display Settings

This chapter explains how to install and remove your Matrox software, and how to configure your display settings to use Matrox Convert DVI.

Hardware detection

The first time you connect your Convert DVI to your computer's USB port (and your computer is on), the Windows "Found New Hardware Wizard" will detect your Convert DVI hardware. Because the Matrox ConvertUtils Setup program will automatically install the appropriate drivers for Convert DVI, you must press **ESC** or click **Cancel** to close the "Found New Hardware Wizard," and then install your Matrox software as explained in the next section.

Note Your display card's configuration utility will also detect Convert DVI as a secondary monitor, and may prompt you to configure your display settings. You can configure your display settings before or after installing the Matrox software. For more information on configuring your display settings, see "Configuring your display settings for use with Convert DVI" on page 17.

Installing your Matrox software

Matrox ConvertUtils Setup installs the Matrox Convert DVI drivers and all the software required to use your Matrox Convert DVI hardware. Before installing Matrox ConvertUtils, make sure that the Convert DVI is connected to your computer using the USB connectors (see "Connecting Convert DVI" on page 8). To download and install the latest version of Matrox ConvertUtils, visit the Support section of our website for your Matrox product at www.matrox.com/video/support.

Note When you install the Convert DVI software, the ConvertUtils Setup program verifies the firmware on your Convert DVI hardware and updates it if required.

If you connect Convert DVI to a different USB port (Windows XP only)

If you connect Convert DVI to a different USB port after you've installed the Convert DVI software on a Windows XP system, the "Found New Hardware Wizard" will appear again. You won't need to re-install the Convert DVI software, but you'll need to use the "Found New Hardware Wizard" to install the required drivers. When the "Found New Hardware Wizard" opens and asks you if it can search for the software, select **No, not this time**, and click **Next**. For each device, select **Install the software automatically (Recommended)**, and then click **Next**. Repeat this step each time the wizard appears until all the required drivers have been installed.

Configuring your display settings for use with Convert DVI

When the Convert DVI hardware is connected to your computer as explained in "Connecting Convert DVI" on page 8, and the software has been successfully installed (see "Installing your Matrox software" on page 16), Windows will detect Convert DVI as a secondary monitor. Because Convert DVI does not have a screen, in order to see the Convert DVI desktop, you must do one of the following:

- **Extend your displays** Connect a DVI monitor or other display device, such as a projector, to Convert DVI's DVI OUT, and then extend your primary display to the Convert DVI's display. This will allow you to use the Convert DVI to preview your video output. For example, you can have the Convert DVI Control Panel open on your primary display, and simultaneously have a video clip open on the Convert DVI's display. This allows you to work on your primary display, while ensuring that only the video clip on the Convert DVI's display is being routed to the Convert DVI's analog and SDI video outputs.
- **Duplicate (clone) your displays** You can also duplicate your primary display onto your Convert DVI's display. This ensures that your primary display is being routed to the Convert DVI's analog and SDI video outputs. This option is useful if you don't have a secondary monitor to connect to Convert DVI's DVI OUT, or if you are conducting a training video for example, where you want your audience to see everything you are doing on your primary display. If your primary display does not support your desired desktop resolution, you can change your display settings to make Convert DVI your primary display, allowing you to select any resolution supported by Convert DVI.

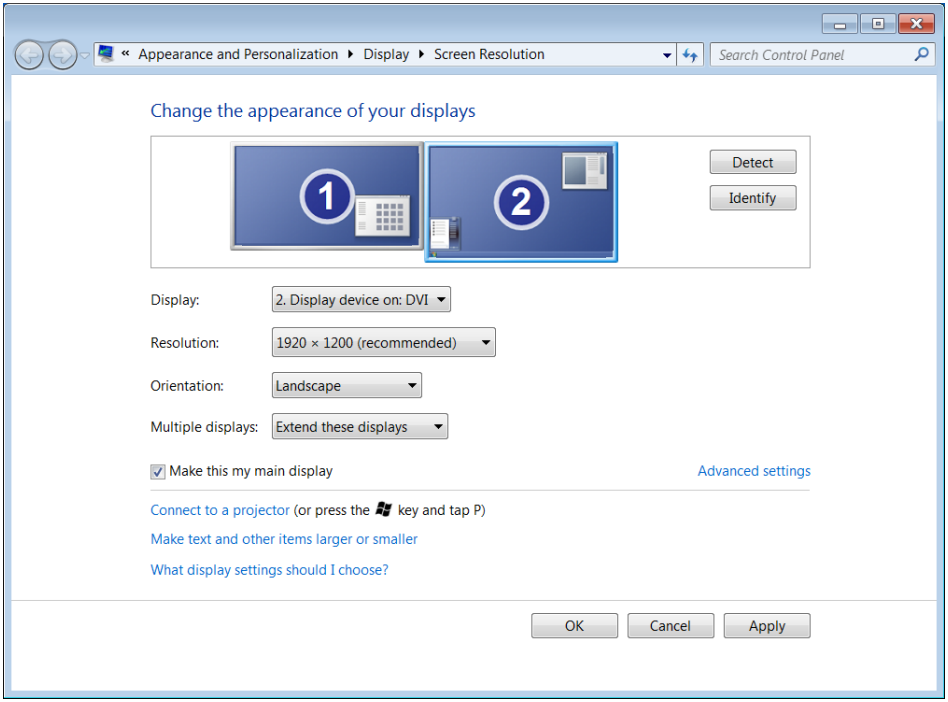
Remarks

- Although the instructions provided in this section describe how to use Windows to configure your display settings, you can use your display card's configuration utility if you prefer.
- It is recommended that you install the latest display drivers for your system's display card before working with Convert DVI. For more information, see your display card's documentation.

To configure your display settings in Windows 7:

1 Right-click on your desktop and choose **Screen Resolution**, or from the **Start** menu, choose **Control Panel > Appearance and Personalization > Display > Screen Resolution**.

Note If you are using an earlier version of Windows, the procedure for configuring your display settings may be slightly different than what is described here. Refer to your Windows documentation for more information.



2 Choose how you want to use your Convert DVI by either extending or duplicating your displays:

a **Extending your primary display** If you see two monitor icons displayed, from the **Multiple displays** list, select **Extend these displays**. If you see more than two monitor icons displayed, click the monitor icon that represents your Convert DVI (click **Identify** if you're not sure), and then from the **Multiple displays** list, select **Extend desktop to this display**.

b **Duplicating your primary display** If you see two monitor icons displayed, from the **Multiple displays** list, select **Duplicate these displays**. If you see more than two monitor icons displayed, click the monitor icon that represents your Convert DVI (click **Identify** if you're not sure), and then from **Multiple displays** list, select **Duplicate**

desktop on 1 and 2 (or whichever combination represents your primary display and Convert DVI display).

c **Duplicating your Convert DVI's display** To make Convert DVI your primary display, click the monitor icon that represents your Convert DVI (click **Identify** if you're not sure), select **Make this my main display**, and then click **Apply**. Then, from the **Multiple displays** list, select **Duplicate these displays**.

Note If Windows doesn't provide settings for extending or duplicating your displays, you'll need to use your display card's configuration utility to configure your display settings. Refer to your display card's documentation for more information.

3 Click the monitor icon that represents your Convert DVI, and from the **Resolution** list, set your desired Convert DVI desktop resolution according to how you want to use Convert DVI:

– If you want to output a specific area of your Convert DVI desktop (see "Specifying your region of interest settings" on page 29), it is recommended that you set your Convert DVI desktop resolution to the highest resolution supported by both your display card and Convert DVI.

– If you want to output your entire Convert DVI desktop, it is recommended that your Convert DVI desktop resolution and video output format are close in size. For example, if you want to output NTSC video, set your Convert DVI desktop resolution to 800×600 for best results.

Important Before using Convert DVI in stand-alone mode, make sure to set your desired Convert DVI desktop resolution to the resolution of the DVI input device that will be connected to Convert DVI in stand-alone mode. For more information on stand-alone mode, see "Programming Convert DVI to stand-alone mode" on page 33.

Supported Convert DVI desktop resolutions

Convert DVI supports the following common desktop resolutions (some resolutions may not be supported on all display cards or DVI input devices):

- 800×600
- 1024×768
- 1280×720
- 1280×1024
- 1600×900
- 1600×1200
- 1680×1050
- 1920×1080
- 1920×1200

Note Other resolutions may work with Convert DVI, but only the resolutions listed above have been tested and approved by Matrox for use with Convert DVI.

If you have display issues when starting Windows

After connecting Convert DVI and starting your computer, if your primary display is black, has an incorrect resolution, or your system does not detect your primary display, one of the following issues may be the cause:

- Your system has incorrectly set your primary display resolution, or has automatically set the Convert DVI as your primary display because the Convert DVI is capable of using a higher resolution than the physical monitor connected to your primary DVI OUT. If this happens, disconnect the Convert DVI from your display card, restart your system and log on to Windows, re-connect the Convert DVI to your display card's second DVI OUT, and then follow the steps in "Configuring your display settings for use with Convert DVI" on page 17.
- You have accidentally connected the Convert DVI to the DVI OUT on your display card that is associated with your primary display. If this happens, disconnect both the Convert DVI and your monitor from your display card, connect your monitor to your display card's primary DVI OUT, restart your computer, connect the Convert DVI to your display card's second DVI OUT, and then follow the steps in "Configuring your display settings for use with Convert DVI" on page 17.

Retrieving a window from the Convert DVI desktop

If you have a monitor connected to your Convert DVI, and you are extending your primary desktop to your Convert DVI desktop, certain applications may open windows on your Convert DVI desktop instead of your primary desktop. If you later disconnect the monitor from Convert DVI, you will not be able to see any windows that open on your Convert DVI desktop, and you may need to retrieve the hidden windows.

To retrieve a hidden window:

1. Right-click the program window on your taskbar, and then click **Move.**

Note If you see that **Move** is unavailable when you right-click the program window, it means the hidden window has been minimized. Click **Restore** and then repeat step 1.

2. Press one of the arrow keys on your keyboard to lock your mouse cursor onto the window, and then drag the window back to your primary display.

Removing your Matrox software

To remove the software for your Matrox Convert DVI, choose **Start > All Programs > Matrox ConvertUtils > Uninstall Matrox ConvertUtils**.

Your notes

4

Configuring Matrox Convert DVI

This chapter explains how to use your Matrox Convert DVI Control Panel.

Using the Matrox Convert DVI Control Panel

The Matrox Convert DVI Control Panel has several pages that you can use to specify various settings to configure your Matrox Convert DVI, such as your video output format, genlock, and region of interest settings.

Remarks

- In order to configure Convert DVI, it must be connected to your computer via the USB connectors as explained in "Connecting Convert DVI" on page 8.
- Before configuring Convert DVI as explained in this chapter, you should make sure that you have specified your desired display settings for the Convert DVI desktop (see "Configuring your display settings for use with Convert DVI" on page 17). If you change your Convert DVI desktop's display settings **after** configuring Convert DVI, the video output may be distorted. If this happens, you must re-configure and re-apply your Convert DVI settings.

⇨ **To open the Convert DVI Control Panel, do any of the following:**

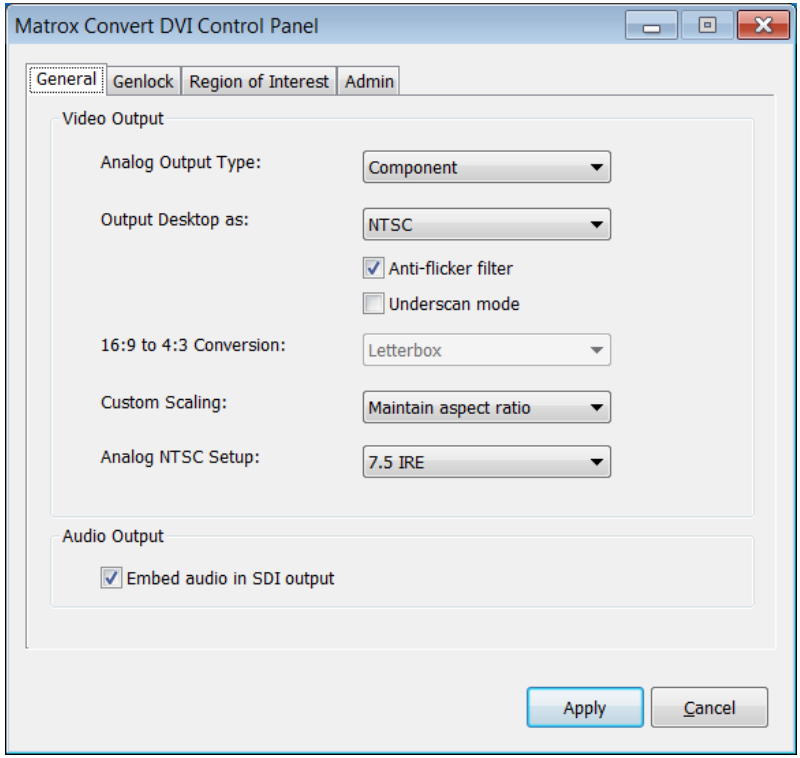
- Double-click the icon on the Windows taskbar.
- Right-click the icon and then choose **Open Matrox Convert DVI Control Panel**.
- Choose **Start > All Programs > Matrox ConvertUtils > Matrox Convert DVI Control Panel.**

Specifying your general settings

To specify the Convert DVI's general settings:

1 Open the Matrox Convert DVI Control Panel.

2 Click the **General** tab.



3 From the **Analog Output Type** list, select the type of analog video output you want. You can select either **Component** or **Composite and S-Video**.

4 From the **Output Desktop as** list, select the video format you want for the Convert DVI's video output. If the resolution of your Convert DVI desktop doesn't match your selected video output format, the video output will be displayed according to your selected conversion or scaling setting (see steps 5 and 6).

Note The SDI output follows the SMPTE 259M specification for SD-SDI video, or the SMPTE 292M specification for HD-SDI video.

– The **Anti-flicker filter** option is enabled by default to prevent flickering when previewing interlaced video. You may want to clear this option when working with graphics files, or when displaying full-screen video.

- Select **Underscan mode** to output the full video frame, which includes the edges of your video that may be visible only on production monitors. Clearing this option displays only the safe area of a video frame that is visible on all standard televisions and monitors.

5 If you are downscaling 16:9 material to 4:3, from the **16:9 to 4:3 Conversion** list, select one of the following options to indicate how you want your video to be output:

- **Center cut** Outputs the widescreen picture by evenly cropping the left and right edges of the picture for display on a standard 4:3 television screen.
- **Letterbox** Outputs the widescreen picture in letterbox mode by adding black bars at the top and bottom of the picture for display on a standard 4:3 television screen.
- **Anamorphic** Outputs the widescreen picture as horizontally compressed 4:3 video, which retains the picture's full vertical resolution for display on a widescreen television. To display the video with the correct proportions on an NTSC or PAL monitor, select the 16:9 display setting on the monitor.

6 If you are outputting material that has a non-standard aspect ratio, from the **Custom Scaling** list, select one of the following options to indicate how you want your video to be output (picture can be downscaled only):

- **Scale to fit** Scales the picture to fit the entire screen.
- **Maintain aspect ratio** Displays the picture at its original aspect ratio, and centers the picture on the screen.

7 From the **Analog NTSC Setup** list, select the setup level you want for your NTSC analog video outputs:

- **7.5 IRE** Applies the standard NTSC setup level of 7.5 IRE.
- **0 IRE** Applies a setup level of 0 IRE. You should select this option only when working with a commercial DV-1394 device that uses the Japanese analog NTSC setup of 0 IRE. For example, if the video appears too bright when you play back DV clips on your NTSC monitor, you can change the setup to 0 IRE to output your DV clips at the correct brightness.

8 Under **Audio Output**, select **Embed audio in SDI output** if you want your computer's audio to be embedded in Convert DVI's SDI output signal.

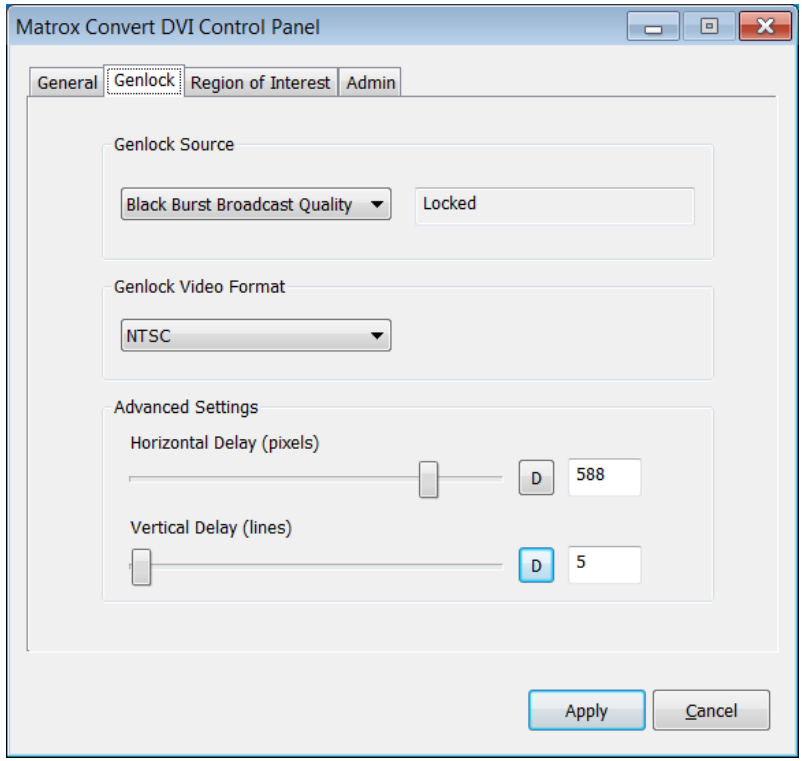
9 Click **Apply** for your settings to take effect.

Specifying your genlock settings

To specify the Convert DVI's genlock settings:

1 Open the Matrox Convert DVI Control Panel.

2 Click the **Genlock** tab.



3 Under **Genlock Source**, select one of the following:

- **Internal** Select this to genlock to Convert DVI's internal reference signal. Select this option only if you don't have an external sync generator connected to the REF IN on your Convert DVI.
- **Black Burst Broadcast Quality** Select this if you connected an external sync generator to the REF IN on your Convert DVI.

The status of your genlock source will be displayed as **Locked** or **Not Locked** to indicate whether or not Matrox Convert DVI is presently locked to your genlock source.

4 Under **Genlock Video Format**, select your external genlock source's video format (this setting is not applicable if you're genlocking to Convert DVI's internal reference signal).

Important To ensure good output results, make sure that your genlock source's video format is compatible with the Convert DVI video output format.

5 Under **Advanced Settings**, drag the **Horizontal Delay** and **Vertical Delay** sliders to adjust the horizontal and vertical timing of the Convert DVI's video outputs with respect to your genlock source. This lets you compensate for cable delays within your system. Click the D button to return a slider to its default position.

6 Click **Apply** for your settings to take effect.

Specifying your region of interest settings

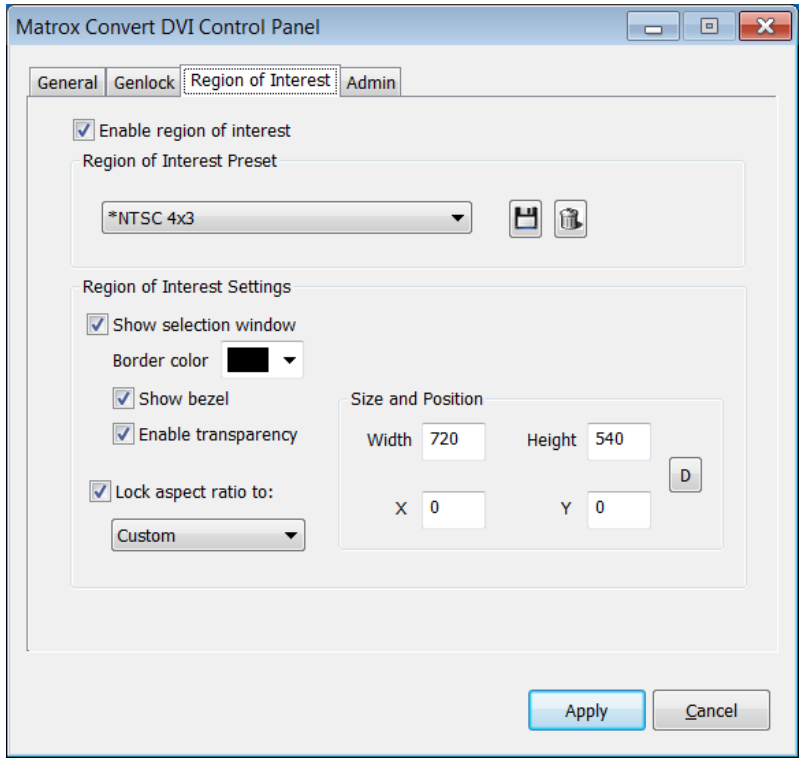
The region of interest feature allows you to output a specific area of your Convert DVI's desktop, instead of the entire desktop. A customizable shaded window is used to select the area of your Convert DVI desktop that you want to output.

Note Although the selection window changes dynamically whenever you modify the settings described in this section, you must click **Apply** for your changes to appear in your video output.

To specify the Convert DVI's region of interest settings:

1 Open the Matrox Convert DVI Control Panel.

2 Click the **Region of Interest** tab.



3 Select **Enable Region of Interest** to use the region of interest presets and settings.

4 Under **Region of Interest Preset**, you can select one of the available presets from the list to display a region with predetermined settings.

– Select **NTSC 4:3**, **NTSC 16:9**, **PAL 4:3**, **PAL 16:9**, **1280 × 720**, or **1920 × 1080** to display a rectangle of a specific size based on the Convert DVI's supported output formats. These presets are hardcoded and cannot

be deleted or overwritten. The names of presets that cannot be changed or deleted are prefixed with an asterisk (for example, ***NTSC 4:3**).

Note Although the industry-standard resolutions for NTSC and PAL are 720×486 and 720×576, the presets for NTSC 4:3 and PAL 4:3 have been modified to 720×540 and 768×576. This compensates for the square pixels of a DVI monitor, and ensures that Convert DVI properly displays NTSC and PAL video.

- **Preset1**, **Preset2**, **Preset3**, and **Preset4** are designed to be overwritten with your own custom settings (see step 5). You can use keyboard shortcuts to quickly toggle through any of these four presets (see "Keyboard shortcuts" on page 31). To overwrite one of these presets, after you have created your custom region of interest window, click the icon, type the preset name you want to overwrite (such as **Preset1**), and click **Yes**.
- You can also add or delete custom presets by using the icons next to the **Region of Interest Preset** list. Click to save the current settings as a preset, or select a preset from the **Region of Interest Preset** list, and then click to delete it.

5 Under **Region of Interest Settings**, select **Show selection window** to display the customizable region of interest on your Convert DVI desktop, and access other selection window settings. You can also press **CRTL+SHIFT+F12** to show/hide the selection window.

- Select **Border color** to change the color of the selection window's border and bezel. This may make it easier to see the selection window's border on darker video clips.
- Select **Show bezel** to display the action-safe area (larger dotted line) and title-safe area (smaller dotted line) of the selection window. This feature is useful in identifying the areas of your clip that would be hidden by a bezel when displayed on a standard television screen. The bezel is displayed only when your selection window has a 4:3 or 16:9 aspect ratio.
- Select **Enable transparency** to make the selection window completely transparent. The selection window border will still be visible on your Convert DVI desktop.

Note Only the area within the border will be displayed in your video output. The border itself will not be visible.

6 From the **Lock Aspect Ratio to** list, select **Custom**, **4:3**, or **16:9** to make sure that your selection window maintains your desired aspect ratio, regardless of the window's size. Holding down **SHIFT** while using your mouse to resize the window also maintains the window's aspect ratio.

7 You can adjust the size of the selection window by dragging its borders, and move the window by clicking anywhere within the window and dragging it

across the screen. When you do this, the values under **Size** and **Position** will change dynamically.

– You can also type a value for **Width** and **Height** to specify the size of the region of interest window in pixels, and type a value for **X** and **Y** to set the position of the region of interest window on the Convert DVI desktop (0,0 places the region at the desktop's top-left corner).

Note An error message will appear if you enter a width or height that won't fit on the desktop because of the entered position value. For example, on a monitor with a screen resolution of 1920×1080, if the value entered for **X** is anything other than zero, you will get an error message if you type 1920 for the **Width**.

– Click the default (D) button to create a selection window that is centered and matches the selected video output's frame size (see "Specifying your general settings" on page 25). If the video output's frame size is larger than the Convert DVI desktop's set resolution, the selection window's size will match the desktop's resolution.

8 Click **Apply** for your settings to take effect.

Keyboard shortcuts

You can use the following keyboard shortcuts to select various region of interest settings:

Action	Result
CTRL+SHIFT+F1	Select Preset1.
CTRL+SHIFT+F2	Select Preset2.
CTRL+SHIFT+F3	Select Preset3.
CTRL+SHIFT+F4	Select Preset4.
CTRL+SHIFT+F11	Apply current settings to video output.
CTRL+SHIFT+F12	Show/hide region of interest selection window.

Note If any of the keyboard shortcuts conflict with other software on your system, you can disable the keyboard shortcuts as explained in "Specifying your administrator settings" on page 32.

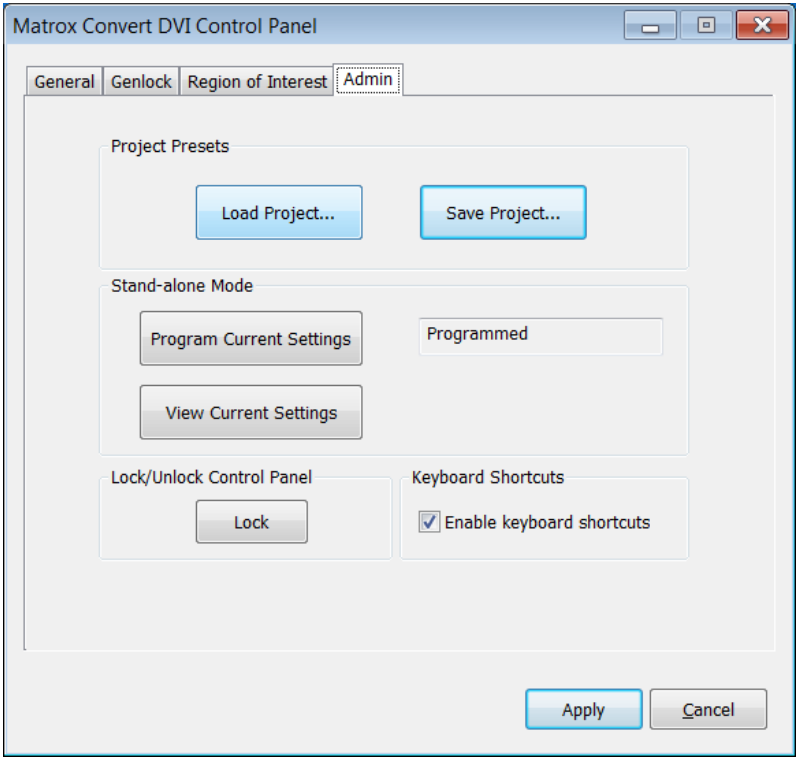
Specifying your administrator settings

The **Admin** page of the Convert DVI Control Panel is used to control the more advanced Convert DVI settings. You should use extra care when adjusting the settings in this area.

⇨ **To specify the Convert DVI's administrator settings:**

1 Open the Matrox Convert DVI Control Panel.

2 Click the **Admin** tab.



3 Under **Project Presets**, you can save your own custom Convert DVI settings for future use. Click **Load Project** to load a previously saved project preset that has the settings you want to apply, or click **Save Project** to save the current Convert DVI settings as a project preset.

4 Under **Stand-alone Mode**, click **Program Current Settings** to copy the currently applied control panel settings to the Convert DVI's internal memory. Make sure to click **Apply** on any of the Convert DVI Control Panel pages where you made changes before programming to stand-alone mode. Your Convert DVI's stand-alone mode status will be displayed as **No programmed settings** if there are no settings currently in the Convert

DVI's internal memory, or **Programmed** to indicate that Convert DVI currently has settings programmed to stand-alone mode.

For more information on stand-alone mode, see "Programming Convert DVI to stand-alone mode" on page 33.

5 Click **View Current Settings** to display the current control panel settings, and the current stand-alone mode settings that are saved in the Convert DVI's internal memory.

6 Under **Lock/Unlock Control Panel**, you can lock or unlock the Convert DVI Control Panel, and create and manage your password. When the control panel is locked, you won't be able to change any of the settings. This prevents unintentional changes to the settings. To unlock the control panel, you'll be required to enter a password.

Note If you can't remember your current password, you can retrieve it from the Windows registry editor. Choose **Start > Run**, type *regedit* in the text box provided, and then press **ENTER**. In the registry tree, on the left, go to *HKEY_CURRENT_USER\Software\Matrox\Convert\Password*. The Convert DVI's current password is under *Data*.

7 Under **Keyboard Shortcuts**, select **Enable keyboard shortcuts** if you want to use shortcut keys to select various region of interest settings. You can clear this option if you find that any of the keyboard shortcuts conflict with other software on your system. For a list of keyboard shortcuts, see "Keyboard shortcuts" on page 31.

Programming Convert DVI to stand-alone mode

Before programming Convert DVI to stand-alone mode, make sure that you have set your Convert DVI desktop resolution to match the resolution of the DVI input device that you want to use with Convert DVI in stand-alone mode (see "Configuring your display settings for use with Convert DVI" on page 17).

Note Only settings that have been **applied** to your video output will be programmed to stand-alone mode. Therefore, make sure to click **Apply** on any of the Convert DVI Control Panel pages where you have made changes before programming to stand-alone mode.

After you have specified and applied your Convert DVI settings to your video output, you are ready to use your Convert DVI in stand-alone mode. Click **Program Current Settings** on the **Admin** page of the Convert DVI Control Panel to copy your applied settings to the Convert DVI's internal memory. The status window will indicate that programming is in progress, and display **Programmed** when the process is complete.

Caution Do **not** disconnect the Convert DVI's USB cable or power cord until the programming process is complete. Doing so may damage your Convert DVI hardware.

After you have programmed stand-alone mode, you can continue working with your Convert DVI if you choose, but you must click **Program Current Settings** again to re-program any new settings that you have applied.

When you are ready to use Convert DVI in stand-alone mode:

1. Disconnect the USB cable and the power cord from the Convert DVI.
2. If you haven't already done so, connect your desired DVI-based input device to the DVI IN connector on Convert DVI. If you also want to output audio, plug the male stereo audio plug on the Convert DVI cable into your source device's audio output jack.
3. Re-connect the Convert DVI power cord. Your Convert DVI will boot in stand-alone mode with the settings that you last programmed.

You cannot change any Convert DVI settings unless Convert DVI is connected to a computer using the USB connectors, and the Convert DVI software is installed. When you reconnect the USB cable, it may take up to a minute for the Convert DVI video output to resume. If the Matrox Convert DVI Control Panel does not respond after you have reconnected the USB cable, close and then re-open the control panel. For information on typical Convert DVI connections, see "Typical Matrox Convert DVI connections" on page 11.

Note If you install a new version of the Matrox ConvertUtils software that initiates a firmware update on your Matrox Convert DVI, the Convert DVI's stand-alone mode settings will be erased. You'll therefore need to re-program Convert DVI to stand-alone mode.

5

Monitoring Your Matrox Convert DVI System

This chapter explains how to use the Matrox X.info program to display important details about your Matrox Convert DVI system and installed hardware.

Using X.info to display Convert DVI information

The Matrox X.info program lets you display information about your Matrox Convert DVI system and installed hardware, and provides warnings when certain problems arise, such as when the temperature of your Convert DVI exceeds the maximum operating temperature.

Matrox X.info runs continuously to monitor your system, whenever your computer is turned on and the Convert DVI is connected. You can open Matrox X.info to display system and hardware details by double-clicking the icon on your Windows taskbar.

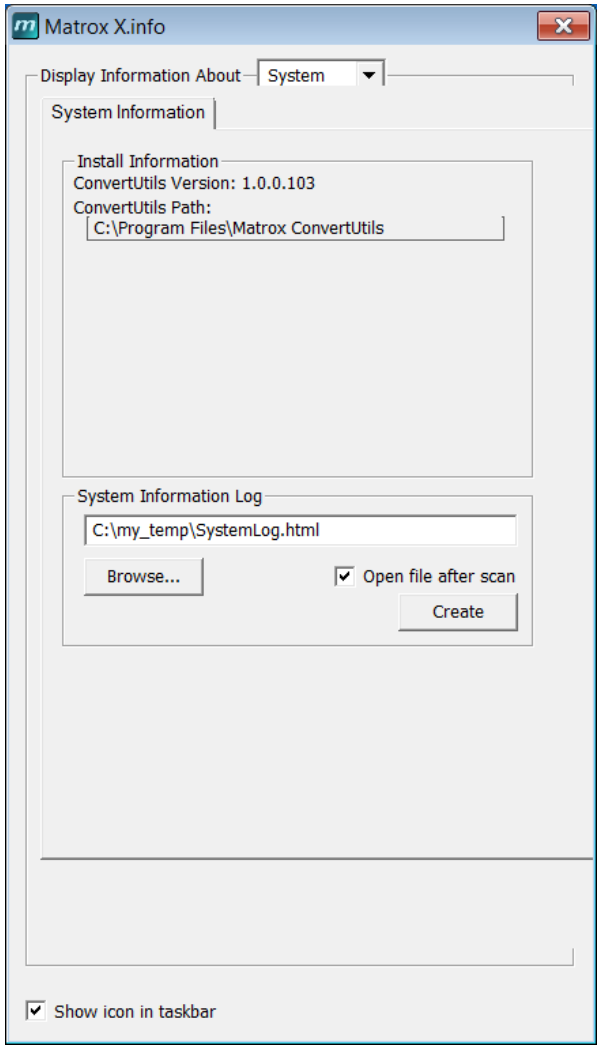
Note If you do not see the icon, right-click the notification area of the taskbar and choose **Properties**, clear the **Hide inactive icons** option, and click **OK**.

Displaying system information

To display information about your Matrox Convert DVI system, select **System** from the **Display Information About** list. On this page, you can see **Install Information**, such as the install path and version of Matrox ConvertUtils.

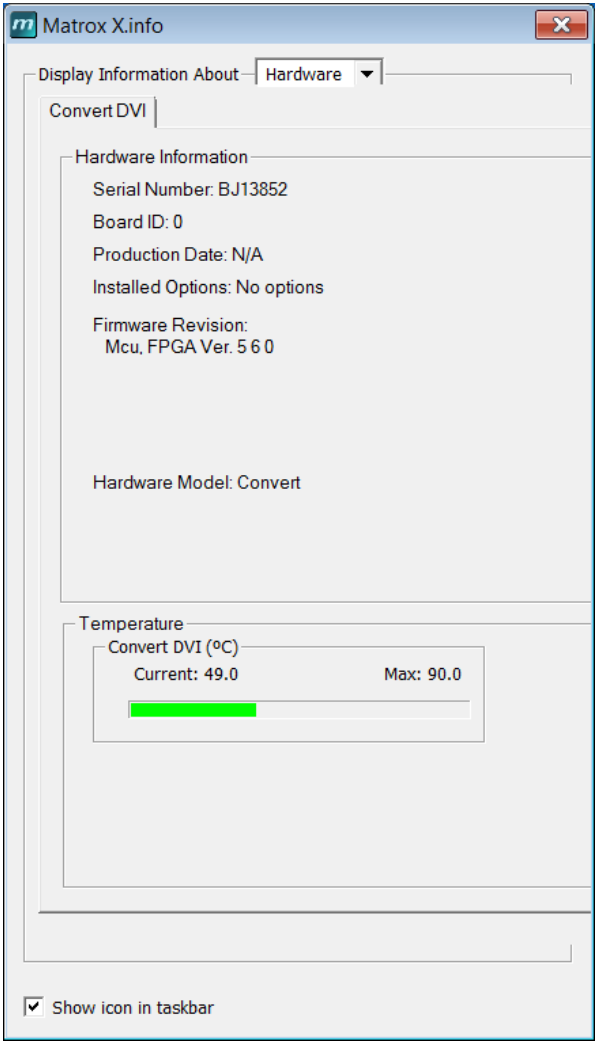
You can also create an HTML log file of your system information, which can be useful for troubleshooting. To create this log, use the **Browse** button under **System Information Log** to select the path and name of the log, then click

Create. If **Open file after scan** is selected, the HTML system log opens after it is created.



Displaying hardware information

To display information about your Matrox Convert DVI hardware, select **Hardware** from the **Display Information About** list. This displays a page with hardware information (for example, serial number and production date). You can also monitor the current and maximum operating temperatures for your Convert DVI hardware.



Important Whether or not you have opened Matrox X.info, if your Convert DVI exceeds the maximum operating temperature, you'll receive a warning message with further instructions as explained in the section "Error notification" on page 39.

Monitoring your Convert DVI's operating temperatures

As shown in the X.info **Hardware** section, the **Convert DVI** page displays the current and maximum operating temperatures for your Matrox Convert DVI hardware. To avoid damage to your Matrox Convert DVI, make sure that you don't operate your Convert DVI at or near the maximum temperature for a prolonged period of time. You should target your Convert DVI to operate at least 10°C below the maximum operating temperature.

You should monitor the temperature of your Convert DVI periodically and take measures as needed to lower the room temperature and/or make sure that the Convert DVI is not close to a heat source and the ventilation holes are not obstructed.

Error notification

X.info provides temperature warnings and warnings for other possible Convert DVI hardware problems. Once X.info has detected a hardware problem, the **Matrox X.info Notification** dialog box will be displayed to give you details of the problem and further instructions. You will not be able to close this dialog box until the problem has been resolved.

Your notes

A

Matrox Convert DVI Specifications

This appendix provides specifications for the Matrox Convert DVI box.

Matrox Convert DVI box specifications

General

Video standards	NTSC, PAL, NTSC-EIAJ, 720p, 1080i
Regulatory compliance	FCC Class A, CE Mark Class A, C-Tick Mark, VCCI RoHS Directive 2002/95/EC
Dimensions	L 151 mm × W 161 mm × H 46 mm (5.94" × 6.34" × 1.81")
Operating voltages	External AC/DC adapter: 100-240 V AC 50-60 Hz (5 V DC, 3 A max.) Convert DVI unit: +5V DC, 3A max., 2.5mm barrel type connector
Total power consumption	10 watts

Connections

DVI input and output	DVI-I (single-link) 29-pin port
Genlock reference input	SD analog black burst (bi-level) or HD tri-level sync BNC connector (75 Ω), terminated
SDTV SDI output	SD-SDI with 4 channels of embedded SDI audio 24-bit, 48 kHz BNC connector (75 Ω) Compliant with SMPTE 259M-C, SMPTE 272M
SDTV S-Video & composite video output	PAL, NTSC, NTSC-EIAJ Frequency response: +/- 0.25 dB max to 5 MHz 2T pulse response: 0.5% max Diff. Gain and Diff. Phase: < 2% BNC connectors (75 Ω)
SDTV analog component video output	Betacam, Betacam SP (NTSC & NTSC-EIAJ) SMPTE/EBU N10 (PAL) Frequency response Y: +/- 0.25 dB max to 5 MHz Frequency response Pb, Pr: +/-0.2 dB max to 2 MHz Component channel delay: +/- 3ns Component S/N (Y, Pb, Pr): > 54 dB, unified weighted BNC connectors (75 Ω)
HDTV SDI output	HD-SDI with 4 channels of embedded SDI audio 24-bit, 48 kHz Compliant with SMPTE 292M, SMPTE 299M BNC connector (75 Ω)
HDTV analog component video output	720p, 1080i Compliant with EIA-770.3 Frequency response Y: +/- 0.3 dB max to 28 MHz Frequency response Pb, Pr: +/-0.4 dB max to 14 MHz Component channel delay: +/- 0.5ns Component S/N (Y, Pb, Pr): > 57 dB, unified weighted BNC connectors (75 Ω)

Analog stereo line out	Left and right RCA connectors 4.35 Vp-p (+6 dBu) maximum output level
Analog stereo loop through	Input: Stereo 3.5mm male plug on Convert DVI cable Output: Stereo 3.5mm female jack on Convert DVI cable 4.35 Vp-p (+6 dBu) maximum input/output levels
Other	USB 2.0 type B port 2.5mm DC power jack

Environmental specifications

- Minimum/maximum ambient operating temperatures: 0 to 45º C
- Minimum/maximum storage temperature: –40 to 75º C
- Maximum altitude for operation: 3,000 meters
- Maximum altitude for transport: 12,000 meters
- Operating humidity: 20 to 80% relative humidity (non-condensing)
- Storage humidity: 5 to 95% relative humidity (non-condensing)

Your notes

B

Matrox Customer Support

This appendix explains how you can register your Matrox product and obtain customer support.

How to get Matrox customer support

If you have a problem that you're unable to solve by referring to the documentation for your Matrox product, please contact your Matrox representative. He or she should be able to help you quickly correct any installation or system configuration problem.

If your representative is unable to solve your problem, contact Matrox for further information and assistance.

Registration

You can register your Matrox product in the Matrox Support section of our website at www.matrox.com/video/support.

Only registered users are entitled to customer support, software updates, special promotional offers, and access to our user forum.

Keep up to date with our website

In addition to registering your Matrox product, our website offers you up-to-the-minute information about Matrox products and software updates. Be sure to place our site in your favorites or bookmarks: www.matrox.com/video/support.

Contacting us

Matrox is proud to offer worldwide customer support. Please use the contact information for your Matrox product and area as provided on our website at www.matrox.com/video/support.

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Compliance Statements

USA

FCC Compliance Statement

Remark for the Matrox hardware products supported by this guide

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or modifications to this unit not expressly approved by the party responsible for the compliance could void the user's authority to operate this equipment. The use of shielded cables for connection of the equipment and other peripherals is required to meet FCC requirements.

Canada

(English) Industry Canada Compliance Statement

Remark for the Matrox hardware products supported by this guide

These digital devices do not exceed the Class A limits for radio noise emission from digital devices set out in the Radio Interference Regulation of Industry Canada.

(Français) Conformité avec les exigences de l'Industrie Canada

Remarque sur les produits matériels Matrox couverts par ce guide

Ces appareils numériques n'émettent aucun bruit radioélectrique dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par Industrie Canada.

Europe

CE

(English) European user's information – Declaration of Conformity

Remark for the Matrox hardware products supported by this guide

These devices comply with EC Directive 2006/95/EC for a Class A digital device. They have been tested and found to comply with EN55022/CISPR22 and EN55024/CISPR24. In a domestic environment these products may cause radio interference in which case the user may be required to take adequate measures.To meet EC requirements, shielded cables must be used to connect the equipment and other peripherals.

(Français) Informations aux utilisateurs Européens – Déclaration de conformité

Remarque sur les produits matériels Matrox couverts par ce guide

Ces unités sont conformes à la directive communautaire 2006/95/EC pour les unités numériques de classe A. Les tests effectués ont prouvé qu'elles sont conformes aux normes EN55022/CISPR22 et EN55024/CISPR24. Le fonctionnement de ces produits dans un environnement résidentiel peut causer des interférences radio, dans ce cas l'utilisateur peut être amené à prendre les mesures appropriées. Pour respecter les impératifs communautaires, les câbles de connexion entre l'équipement et ses périphériques doivent être blindés.

(Deutsch) Information für europäische Anwender – Konformitätserklärung

Anmerkung für die Matrox Hardware-Produktunterstützung durch dieses Handbuch

Diese Geräte entsprechen EC Direktive 2006/95/EC für ein digitales Gerät Klasse A. Sie wurden getestet und entsprechen demnach EN55022/CISPR22 und EN55024/CISPR24. In einer Wohnumgebung können diese Produkte Funkinterferenzen erzeugen, und der Benutzer kann genötigt sein, entsprechende Maßnahmen zu ergreifen. Um EG-Anforderungen zu entsprechen, müssen zum Anschließen des ausrüstung und anderer Peripheriegeräte abgeschirmte Kabel verwendet werden.

(Italiano) Informazioni per gli utenti europei – Dichiarazione di conformità

Nota per i prodotti hardware Matrox supportati da questa guida

Questi dispositivi sono conformi alla direttiva CEE 2006/95/EC relativamente ai dispositivi digitali di Classe A. Sono stati provati e sono risultati conformi alle norme EN55022/CISPR22 e EN55024/CISPR24. In un ambiente domestico, questi prodotti possono causare radiointerferenze, nel qual caso all'utente potrebbe venire richiesto di prendere le misure adeguate. Per soddisfare i requisiti CEE, l'apparecchiatura e le altre periferiche vanno collegati con cavi schermati.

(Español) Información para usuarios europeos – Declaración de conformidad

Observación referente a los productos de hardware de Matrox apoyados por este manual

Estos dispositivos cumplen con la directiva de la CE 2006/95/EC para dispositivos digitales de Clase A. Dichos dispositivos han sido sometidos a prueba y se ha comprobado que cumplen con las normas EN55022/CISPR22 y EN55024/CISPR24. En entornos residenciales, estos productos pueden causar interferencias en las comunicaciones por radio; en tal caso el usuario deberá adoptar las medidas adecuadas. Para satisfacer las disposiciones de la CE, deberán utilizarse cables apantallados para conectar el equipo y demás periféricos.

www.matrox.com/video